



Mr
Learnie

LearnToLearn

Curriculum Pack



45120
LearnToLearn Core Set and Curriculum Pack



education

Children should be allowed to express themselves in any way they want

Thank you for choosing LearnToLearn from LEGO® Education.

In many schools around the world, children are still being taught to express themselves using traditional means, primarily using pen and paper. At LEGO Education, we believe that children should also be given the opportunity to experience a progressive learning method that is more effective, motivating, and engaging.

LEGO Education provides children with the opportunities they need to become effective learners and to develop the skills demanded by the 21st century: Collaboration, Communication, Creativity, Critical Thinking and Problem Solving. We focus on curriculum objectives and learning standards, but we use alternative means to acquire knowledge, rather than traditional pen and paper exercises.

We know from research that when we allow children to use multiple senses during the learning process, they have a far better chance of fully understanding and remembering what they have learnt.

In other words, they will learn how to learn.

Welcome to the world of LEGO Education solutions!



Esben Stærk Jørgensen
President of LEGO Education



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The LEGO® Education approach to learning

LEGO® Education LearnToLearn is an educational tool that helps primary school pupils to achieve curriculum goals within Design & Technology, Literacy, Maths, Science, Computing, and Humanities, while also building and reinforcing the most fundamental learning skills of the 21st century: Collaboration, Communication, Creativity, Critical Thinking and Problem Solving. Like all classroom solutions from LEGO Education, this set of skills is based on “Constructionism”, a school of thought pioneered by progressive theorists Jean Piaget and Seymour Papert.

Concrete experience in a meaningful context

Constructionism starts with the belief that children learn best when they experience things first-hand, within a meaningful context. Unlike simply memorising abstract principles, hands-on experimentation with concrete materials leads to deeper engagement and more memorable learning – especially when children feel that their work is relevant.

LEGO Education and constructionism

LEGO Education solutions combine specially selected LEGO bricks with learning activities designed by education experts and are ideal for hands-on learning. All of our solutions require pupils to experiment with tangible models – building memorable, curriculum-related knowledge as they construct solutions according to carefully developed challenges.

The 4C approach – A structured learning experience

At LEGO Education, we have turned Constructionist principles of learning and knowledge about effective learning into a practical, four-step learning process supported by all of our classroom solutions.

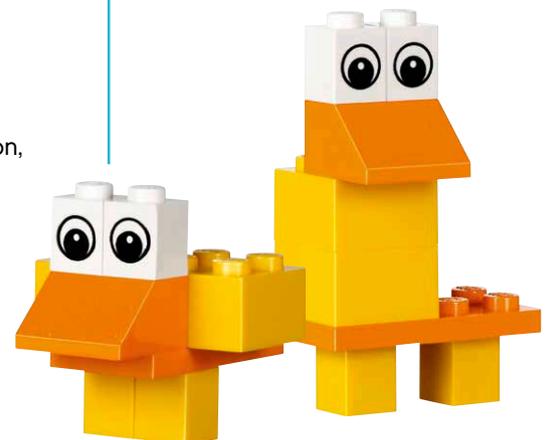
The 4C approach consists of four steps:

- **Connect** phase awakens pupils’ curiosity and the desire to learn.
- **Construct** phase encourages the pupil to tackle the challenge by building something functional or meaningful to them.
- **Contemplate** phase involves reflection and dialogue with the teacher and other pupils, about what everyone has learned from their experience.
- **Continue** phase gives pupils the opportunities to apply their newly acquired knowledge to new challenges and to take ownership of their learning.

Repetitions may occur throughout the process as pupils work continuously through the steps.

Learning to learn

In all phases of the 4C approach, the teacher plays a critical role as a facilitator and guide, helping the pupils to reach their solutions by promoting Collaboration, Communication, Creativity, Critical Thinking, and Problem Solving. Applying this process to curriculum content results not only in the acquisition of curriculum-related knowledge, but in stronger fundamental learning skills.



Getting Started

To help you to communicate the purpose and value of using LEGO® Education LearnToLearn in your classroom, we have supplied letter templates for school management and parents. These can be found on pages 30 and 31.

Introduce LEGO Education LearnToLearn into your classroom by implementing Building Licence activities 1 to 3. These three activities will help you to create guidelines and successful management systems for using bricks in your classroom. Then progress to the activity called “Building Licence – Ready, Set, Build!”, in which pupils will demonstrate their readiness to participate in future activities. When complete, pupils will receive Building Licences, which they can display proudly!

Activities

Each of the activities focus on one subject and skill of the 21st century, however they often incorporate several skills. See the headings for the subject and skill.

Each activity consists of an “Objective”, which describes the key curriculum focus; “Activity steps”, which suggest a natural learning flow; “Discussion questions”, which prompt reflection and discussion; and an “Extension”, which provides more ideas. Year group modifications can be found in the sidebar. Use these to modify the lesson to either Key Stage 1, Lower Key Stage 2, or Upper Key Stage 2. The sidebar also contains photo examples of models built by other pupils during this activity. You can use these for inspiration.

Symbols

Each activity includes a suggested time frame in which to complete the activity steps and discussion questions.

During each activity, pupils can work individually, in pairs, or in groups. The symbols indicate the suggested way of working. However, many activities provide opportunities for pupils to share with others or discuss as a whole group.

Subjects

Design & Technology
Literacy
Maths
Science
Computing
Humanities

Skills of the 21st century

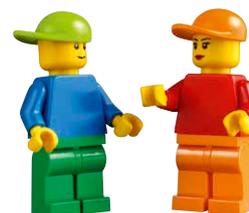
Collaboration
Communication
Creativity
Critical Thinking
Problem Solving



'Time frame' symbol



'Work individually' symbol



'Work with others' symbol

Classroom management tips

Here are some valuable tips from teachers who have used LEGO® Education solutions in the classroom. Try as many of these as you like or adapt them to fit your needs.

Brick management

- Write names or pupil numbers on the bags.
- Use a piece of thin felt, a serving tray, or other material to create a designated building space.
- Allow pupils to work on the floor when possible.
- Create a “lost brick bin” for any bricks that are unclaimed at the end of the activity.
- Two brick separators have been included. Keep them in a special place so that pupils can borrow them when needed. See the sidebar for ways to use the brick separator.

Tidy-up strategies

Try one of these methods to keep track of bricks after each activity. Pupils will become more and more efficient at completing these tasks.

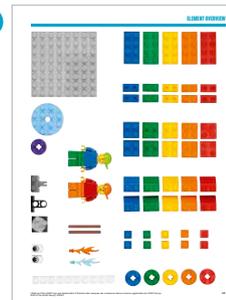
- Print and laminate a colour copy of the Element Overview (page 29) for each pupil. At the end of each activity, ask the pupils to match their bricks to the corresponding image before placing them in their bags, this will ensure that the sets are complete and ready to be used for the next activity. Key Stage 1 and Lower Key Stage 2 pupils may find it easier to separate their bricks into colours before matching them with the image.
- Print and laminate a colour copy of Mr Learnie (page 28) for each pupil and/or provide each pupil with a copy of the building instructions found on pages 33-39. At the end of each activity, ask the pupils to build Mr Learnie. Every brick in the set is needed to make him, so if pupils can complete the model, they know that the sets are complete and ready to be used for the next activity.



Some teachers recommend that the pupils use trays to help them to manage their bricks.



Use the brick separator to lift bricks or push rods out.



Element Overview (page 29)



Mr Learnie (page 28)

Building Licence 1

Objective: Pupils will explore their LearnToLearn sets and practise management skills.

Activity steps

1. Ask the pupils to think of a time when they tried something new, such as a sport, an instrument, or a game. Remind the pupils that it takes lots of practise to become a real professional, and that sometimes it's necessary to acquire or attain a licence before you are deemed qualified to do something, such as drive a car, or to work as a teacher or doctor.
2. Tell pupils about the LearnToLearn sets. Since this is something new, they have to practise to become pros. Tell them that once they have practised using the sets three times and have shown that they are ready to do more activities, they will receive their own Building Licence. Today is the first practise session!
3. Divide the pupils into pairs and inform them that each pair will need a printed copy of Mr Learnie, one big bag, one small bag, and two baseplates. Tell them that the bags contain enough bricks to build two Mr Learnies – one for each pupil. Hand out the materials to the pupils, and give them around 10 minutes to build their own Mr Learnies.
4. Compare all of the models in the class and ensure that they look the same.
5. Ask the pupils to take their Mr Learnie models apart and to use the bricks to build their own models – using only the bricks from their Mr Learnies. Give the pupils around 20 minutes to explore the set and build their models. Encourage the pupils to share their models with each other as they build.
6. Give the pupils a five-minute warning before it's time to clean up. Provide each pupil with a brick bag, and demonstrate how to use the Element Overview or the Mr Learnie model to ensure that they use all of the bricks.

Discussion questions

- What did you build during your exploration time and why?
- Name three things that you have noticed about your set?
- Why is it important that you and your classmates keep track of the bricks?
- How could you improve what you built?
- If you had to change one part of what you built, what would it be?



45-60 min.

Building Licence

Name: _____

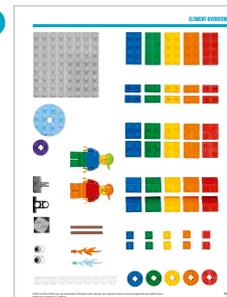
Age: _____

Favorite object to construct: _____

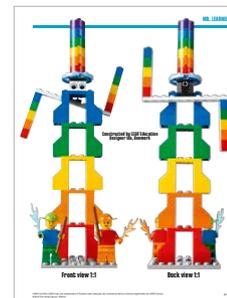
LEGO education

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You may wish to show pupils the Building Licence (template on page 27).



Element Overview (page 29)



Mr Learnie (page 28)

Building Licence 2

Objective: Pupils will sort and categorise bricks in different ways.

Activity steps

1. Ask the pupils to remember the last time they used their LearnToLearn sets. Review successful methods of taking out and putting away their bricks. Remind them that they are each on their way to attaining a Building Licence!
2. Give each pupil their assigned set. Allow them 10-15 minutes to build whatever they want. Give them a two-minute warning before it is time to stop building.
3. Start a discussion about characteristics. Hold up various bricks to demonstrate two different characteristics: colour and shape. Tell the pupils that they are going to sort their bricks into categories based on characteristics. First, ask the pupils to sort by colour. Consider creating a sorting template for the pupils to use.
4. Encourage the pupils to create a name for each category. Document these names for the next activity, "Building Licence 3", where pupils work more with names. Invite pupils to share their names with the person next to them and compare.
5. Ask the pupils to repeat the sorting process by shape instead of colour.
6. Ask the pupils to tidy up using the Element Overview or the Mr Learnie model.

Discussion questions

- How many categories did you make?
- How were the categories similar and/or different?
- Which bricks were difficult to sort and why?



35-50 min.

Year group modifications

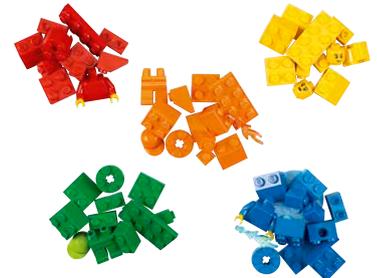
Key Stage 1,

Lower Key Stage 2:

Explain what characteristics are. Shape and colour are two characteristics that pupils can use to describe the bricks. Explain that categories, in this case, are groups of bricks with similar characteristics.

Upper Key Stage 2:

Ask the pupils to sort by several characteristics or by other characteristics, such as size or number of studs (the raised parts on the top of the bricks).



Example solution: Pupils have sorted by colour



Example solution: Pupils have sorted by shape

Building Licence 3

Objective: Pupils will work together to create a set of common names for their bricks.

Activity steps

1. Invite the pupils to remember the names they created for different categories the last time they used their LearnToLearn sets. Discuss how confusing it is when they call the same thing by different names. It would be helpful if they agreed on a name for each brick.
2. Ask the pupils to brainstorm names for each brick, based on individual characteristics and categories. For example, blue round brick, or green square brick, and so forth. Ask the pupils to agree on, or vote for, their favourite names.
3. Create a “brick names list” on a poster. Include images of the bricks with the names they agreed next to them.
4. Tell the pupils that they will be working with a partner to practise using the brick names. Give each pupil their own set. The “naming partner” says the names of five or more bricks from the brick names list. The “building partner” finds those bricks in their set and builds a model with them. Ask both pupils to look at the model to check that the building partner used the bricks that the naming partner intended. Ask the pupils to take turns in each role.
5. Ask the pupils to tidy up, using the Element Overview or the Mr Learnie model.

Discussion questions

- How did you decide on the final names?
- What was difficult about making a group decision?
- When doing the partner activity, how did having common names help?



40-50 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

When it is time to practise using the brick names, choose a helper from the class to assist you in demonstrating this activity to the rest of the pupils.

Upper Key Stage 2:

Give the building partner a time limit of 60 seconds to build their model.



Example solution: A model with seven bricks constructed by the building partner

Building Licence – Ready, Set, Build!

Objective: Pupils will create a Class Guidelines List and demonstrate the knowledge they have gained from the last three activities to receive a Building Licence.

Activity steps

1. Invite the pupils to recall the brick names list they created. Tell them that today they will create a “brick guidelines list”. Ask the pupils to brainstorm the guidelines for successful construction. Write them where everyone can see.
2. Ask the pupils to use their LearnToLearn sets and ask them to select the eight bricks shown in the sidebar illustration using the names from the brick names list.
3. Ask the pupils to build a duck, any way they like, using all eight bricks. As they build, remind them of the guidelines they have created.
4. When the pupils have finished building, ask them to label and place their ducks together so they can compare them. How are they similar and/or different? Point out that each pupil used the same bricks, yet each duck is unique! The pupils can adapt their approach when completing future activities because they are all unique individuals!
5. Congratulate the pupils on following the guidelines. Hand out a Building Licence for each pupil to fill in.
6. Ask the pupils to tidy up using the Element Overview or the Mr Learnie model.

Discussion questions

- Why is it important to agree on class guidelines?
- How were the ducks similar? How were they different?
- Why is it important to recognise that everyone is unique?



40-50 min.



Eight bricks for this activity



Example solution: Ducks constructed by students from around the world!

Possible brick guidelines

- Help others to pick up bricks that have fallen on the floor.
- Always check that you have all of your bricks before putting them away.
- Ask each other for help when needed.
- Solve problems together.
- Communicate with your partner.

Across the river

Objective: Pupils will explore bridge structures by designing and building their own bridges.

Activity steps

1. Tell the pupils about Emma and Thomas, who are good friends. They are on opposite sides of a river. The water is so choppy that neither one of them can swim to the other side. Ask the pupils how they can help Emma and Thomas, perhaps they need a bridge?
2. Guide the pupils in conducting research on bridges. They could study pictures, read articles, or watch a short video.
3. Based on the age and ability of your pupils, choose a brick (or bricks) to represent the river. The wider the river, the more difficult the challenge. Use the two minifigures to represent Emma and Thomas.
4. Ask the pupils to use their LearnToLearn sets to build a bridge for Emma and Thomas. Encourage them to test whether their bridges can support both minifigures.
5. Ask the pupils to share their designs with the class. Ask them to compare the bridges, and to relate them to their research.

Discussion questions

- How did you decide on the design of your bridge?
- What was difficult about this challenge? How did you overcome it?
- How is your bridge design different from and/or similar to other bridges?
- How could you improve your design?

Extension

Encourage pupils to write a story about how their two minifigures came to be on opposite sides of a raging river, and why they need to get to each other. Ask pupils to share their stories with a partner or with the class. Encourage pupils to think about the different materials they could use to construct their bridge in real life, which materials would be best to use? What influenced your choice?

Delve deeper into Design & Technology by designing solutions with the 9686 Simple & Powered Machines Set. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Provide pictures of bridges made from blocks or bricks as inspiration for your pupils.

Upper Key Stage 2:

Tell pupils to research different bridge designs and ask them to choose one to build. You may stipulate additional design constraints, such as the bridge cannot touch the brick (or bricks) representing the river.



Example solution: A stable bridge constructed by Catharina, Brazil



9686 Simple & Powered Machines Set

Maggie's wheelchair

Objective: The pupils will explore wheels and axles and develop an understanding of the needs of others.

Activity steps

1. Start a discussion about wheels and axles. Demonstrate to the pupils that their LearnToLearn sets contain bricks that can be used as wheels and axles, as shown in the sidebar.
2. Tell the pupils about a girl named Maggie, who has used a wheelchair all her life. It is her first day at a new school, and Maggie would like a new wheelchair to start the school year. She wants it to be fast, to keep her safe, and to look interesting and fun!
3. Ask the pupils to work independently, or in pairs, using one LearnToLearn set to design and construct a new wheelchair for Maggie.
4. Encourage the pupils to test and adapt their designs until they are satisfied that Maggie can get to her class on time, safely, and in style!
5. Ask the pupils to share their final designs with the class.

Discussion questions

- How did you decide on your wheelchair design?
- What happened during testing, and how did you change your design?
- What special features did you include?

Extension

Maggie's school has ramps, lifts, and stairs, so Maggie can easily get to her classroom. Ask the pupils to evaluate their own schools. What improvements could be made to meet the needs of everyone? Prompt your pupils to discuss an action plan for school improvements.

Delve deeper into Design & Technology by exploring how wheels, axles, and other simple machines work with the 9686 Simple & Powered Machines Set. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Explain that an axle is a rod placed through the centre of a wheel. Demonstrate this by building an axle with wheels using the bricks from the set (see the sidebar images for examples).

Upper Key Stage 2:

Challenge pupils to build a wheelchair that includes a place for Maggie's rucksack.



Elements for wheels and axles



Example solution: A four-wheeled wheelchair constructed by Sofie, Denmark



9686 Simple & Powered Machines Set

My machine invention

Objective: The pupils will explore and demonstrate an understanding of machines and inventions, by designing and building their own.

Activity steps

1. Start a discussion about machines. Invite the pupils to give examples of machines that have already been invented. Point out that machines are often used to solve problems.
2. Tell the pupils that they are going to invent machines that can be used to solve problems. Choose a problem that corresponds to a current curriculum topic, or use one of the following examples: The machine must feed people, build homes, or make a family member's job easier.
3. Ask the pupils to work independently or in pairs using one LearnToLearn set to invent, design, and construct a machine.
4. Encourage them to ask each other questions and to make observations, and to adapt their models based on their observations. You can also ask the pupils to take photographs of each prototype to record the adaptations they have made.
5. As the pupils finalise their machine inventions, ask them to share their final designs with one another.

Discussion questions

- How does your machine invention solve a problem?
- How would people use the machine?
- What was challenging about inventing a completely new machine? How did you overcome this challenge?

Extension

Prompt the pupils to write manuals detailing the steps to follow when using their machines. You may consider supplying example manuals for inspiration. Encourage pupils who are not proficient in writing to record verbal instructions.

Delve deeper into Design & Technology by building and programming moving machines with motors and sensors, with the 45300 WeDo 2.0 Core Set. Go to www.LEGOEducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Consider making a collage showing pictures of machines to encourage and inspire the pupils.

Upper Key Stage 2:

Specify a type of machine, or impose some design constraints, such as "the machine must contain two moving parts".



Example solution:
A "flying machine"
constructed by
Anne Katrine, Denmark



Example solution: A "sewing maker machine"
constructed by Brixi-jean, United Kingdom



45300 WeDo 2.0 Core Set

Scene builders

Objective: The pupils will build an important scene from a story that they have read or an original story that they have created.

Activity steps

1. Discuss the important elements of stories, such as setting, characters, and plot.
2. Ask the pupils to use their LearnToLearn sets to build a scene from a story. Pupils may build an important scene from a story they have read or from an original story that they have created.
3. If your pupils have built a scene from a story they have read, ask them to write a description of the scene and compare their description with the story. If pupils have built a scene from an original story, ask them to write about that scene.
4. Ask the pupils to share what they have written with the pupil next to them or with the whole class, if time allows.

Discussion questions

- How did you depict the setting (time and place), plot, staging, and so forth using your bricks?
- Why do you feel that this is an important scene?
- What details did you include to make your scene clear to your classmates?

Extension

Ask the pupils to create a “good books to read” bulletin board displaying the completed written summaries in order to encourage other pupils to read the books.

Delve deeper into Literacy by exploring story components, structure, and writing with the 45100 StoryStarter Core Set and StoryVisualizer software. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Pupils may focus on one element, such as settings or characters. When writing, pupils may write words or simple sentences.

Upper Key Stage 2:

Discuss more complex elements of stories with pupils, such as mood and conflict. When writing, pupils may write one paragraph or more.



Example solution: A scene from “The Princess and the Pea” constructed by Eleanor, Denmark



Example solution: A campfire scene from an original story constructed by Emilie, Australia



45100 StoryStarter Core Set

What's that sound?

Objective: The pupils will demonstrate an understanding of letter sounds and/or words.

Activity steps

1. Review sounds that the class have been learning. Based on the pupils' age and ability, they may be single-letter sounds, blended sounds, or words with silent sounds. Make a list of the sounds for the pupils and pick one of the sounds to focus on for this activity.
2. Ask the pupils to make a list of objects that contain that sound. Then ask them to use their LearnToLearn sets to build the objects. For example, Key Stage 1 pupils learning the "s" sound might build a snake, a slide, or a sign. While Lower Key Stage 2 pupils learning the "st" sound, might build a staircase, a store, or a post office.
3. When the pupils have finished building, ask them to share their design with the pupil next to them or with the whole class.
4. Place all the models together, take photographs, and then make a class vocabulary list using the pictures.

Discussion questions

- Is the sound a single-letter sound or a blended sound and why?
- Is the sound at the beginning or at the end of the word you chose?
- Did anyone choose the same word? If so, what are the similarities and/or differences between your models?

Extension

Ask the pupils to write or record silly sentences with alliteration or multiple occurrences of the same sound.



30-45 min.

Year group modifications

Key Stage 1:

Brainstorm words containing the sound before beginning to build. Emergent readers may use the correct sound with a different letter. For example, when exploring the "k" sound, pupils may build a "cat".

Lower Key Stage 2:

Challenge pupils to think about sounds that are in different parts of words. For example, the "sh" sound is in the beginning of "sheep", the middle of "fishing", and the end of "trash".



Example solution: A transformer that demonstrates the "t" sound constructed by Cam, United Kingdom



45100 StoryStarter Core Set

Delve deeper into Literacy by exploring other literary devices with the 45100 StoryStarter Core Set. Go to www.LEGOeducation.com to learn more!

Why describe?

Objective: The pupils will explore descriptive details and words or adjectives.

Activity steps

1. For this activity, use a recent topic or theme from any area, such as Humanities, Science, etc. Ask the pupils to brainstorm a list of people, places, or objects related to that topic or theme.
2. Ask the pupils to use their LearnToLearn sets to build a person, place, or object.
3. Start a discussion about descriptive details and words or adjectives.
4. Ask the pupils to work with a partner, taking turns to guess the person, place, or object that their partner has built. After each incorrect guess, the pupil who built the model must add a descriptive detail to their model. Do this until one of the pupils correctly identifies the model or has made three incorrect guesses.
5. Prompt the pupils to write words or sentences describing the person, place, or object that they have built.

Discussion questions

- What is the most important descriptive word or adjective related to your model and why?
- Why was it important to add descriptive details to your model?
- Why do people use descriptive language?

Extension

Create a class poster of the descriptive words and sentences that the pupils have created, including photographs of their models. Encourage the pupils to use it as a visual dictionary during future writing. Ask the pupils to write a description of their setting using noun phrases and adjectives to describe their characters.



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Explain that an adjective is a word used to describe people, places, or objects. Give some examples before asking the pupils for a list of adjectives.

Upper Key Stage 2:

Ask the pupils to describe their characters using at least four adjectives.



Example solution: The Wright Brothers working on a plane constructed by Dohyun, South Korea



45100 StoryStarter Core Set

Delve deeper into Literacy by creating descriptive stories with the 45100 StoryStarter Core Set and using the StoryVisualizer software to record and document their writing. Go to www.LEGOeducation.com to learn more!

Block and cover

Objective: The pupils will demonstrate spacial thinking, counting, and problem-solving skills while playing a strategic game.

Activity steps

1. Start a discussion about games. Tell the pupils they will be playing a maths game today. The goal is to have the most studs of their colour visible by the end of the game. Remind pupils that studs are the raised parts on top of the bricks.
2. Ask pupils to work with a partner using one LearnToLearn set. Ask each pupil to choose a colour and collect all of the bricks in that colour. Then ask each pupil to place the 2x2, round brick in one of the corners of the building plate, as shown in the sidebar.
3. Prompt the pupils to take turns placing any brick in their colour on the building plate. The first brick must touch their 2x2, round brick. It can be beside it or on top of it.
4. Ask the pupils to take turns placing bricks on the building plate, each new brick must touch at least one brick of their colour. (It is okay to touch the other player's bricks as well.) The pupils can build on top of existing bricks, and the bricks are allowed to extend beyond the edges of the building plate.
5. When both pupils have placed all of their bricks, tally up the final score by counting how many studs are visible. Pupils can display the results in a graph.

Discussion questions

- What strategies did you use while playing the game?
- Which bricks worked best (size and shape) and why?
- How did you work out the score at the end of the game?

Extension

Ask the pupils to work in pairs or small groups to create a problem-solving game of their own using the bricks in the set. Tell them to create a set of instructions, then ask another group in the class to try out their instructions to see if they make sense.

Delve deeper into Maths by exploring the competencies for mathematical problem solving through game-like activities with the 45210 MoreToMaths Core Set 1-2. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

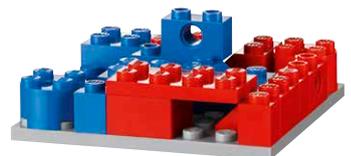
Demonstrate how the game is played by playing it with a pupil. Allow for a trial run of the game.

Upper Key Stage 2:

Create additional rules, such as one player may not cover another player's colours. Or ask the pupils to use two building plates to make the game board larger.



Example solution: The beginning of the game



Example solution: The end of the game: Pupils were asked "How many studs are visible in each colour, and which pupil has the most?"

Red: 25

Blue: 27

Blue has more!



45210 MoreToMaths Core Set 1-2

Mirror, mirror

Objective: The pupils will explore colours, shapes, patterns, and symmetry.

Activity steps

1. Review the concept of symmetry, or use this lesson as an introduction. Show the pupils examples of symmetry, or ask them to research examples to share with the class. Remind the pupils that whatever is on one side has to be on the other for a design to be symmetrical.
2. Ask the pupils to use their LearnToLearn sets to build symmetrical designs. They could do this by placing bricks on the building plate like a mosaic, or by creating a vertical design. Refer to the pictures in the sidebar for examples. It is okay if the designs are not perfectly symmetrical. Some pupils may focus on symmetrical shape while others focus on colour.
3. When the pupils have finished building, ask them to share their designs with the pupil next to them. Ask them to “check” each other’s designs and to offer suggestions for improvements if they think it is necessary.

Discussion questions

- How did you decide on your design?
- How did you check that your design is symmetrical?
- Show me the middle of your design (the symmetry line). Are there more lines of symmetry?

Extension

Ask the pupils to work in pairs. Prompt one pupil to build a design with their LearnToLearn set and the other pupil to build the mirror image of the design using their set. Ask the pupils to reflect their design in the diagonal mirror line.



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

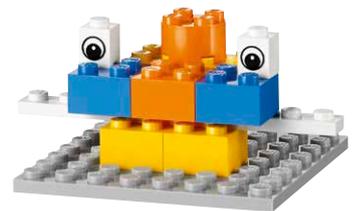
Place a temporary line down the middle of the building plate to emphasise that whatever they build on one side, they must build on the other.

Upper Key Stage 2:

Discuss symmetry lines (vertical versus horizontal) and ask the pupils to place a mirror along the symmetry line to see the symmetrical design. Then remove the mirror and check that their design is symmetrical. You may also introduce diagonal lines of symmetry.



Example solution: Mosaic design constructed by Maria, Brazil



Example solution: Vertical design constructed by Vinicius, Brazil



45210 MoreToMaths Core Set 1-2

Delve deeper into Maths by exploring the competencies for mathematical problem solving with the 45210 MoreToMaths Core Set 1-2. Go to www.LEGOeducation.com to learn more!

What's behind my back?

Objective: The pupils will expand their knowledge of mathematical terms related to positions, numbers, and colours while communicating with a partner.

Activity steps

1. Start a discussion about communication focusing on the need to be clear and concise when speaking.
2. Ask the pupils to work in pairs using their LearnToLearn sets. One of the pupils should pick five bricks from their set. The other pupil should then pick the same bricks from their set. Ask all of the pupils to take out their grey building plates.
3. Ask each pair to sit back-to-back, and ask one of the pupils to build a model on their building plate, the other pupil must not see the design.
4. Ask the pupil that built the model to instruct their partner how to build an exact replica, using descriptive language, such as on top of, on the side, underneath, and so forth.
5. When the pupils have finished building, ask them to compare and contrast the two models. If time allows, ask them to switch roles and repeat the activity.

Discussion questions

- How does it feel to communicate with someone without looking at them?
- What would make this activity easier and why?
- Why is it important to be able to clearly communicate to others?

Extension

Play the model memory game. Show the pupils a pre-built model for just a few seconds, then ask them to build a replica model from memory. Show the model as many times as is necessary for the pupils to complete the replica.

Delve deeper into Maths by exploring the competencies for mathematical problem solving with the 45210 MoreToMaths Core Set 1-2. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Allow pupils to ask questions or briefly look at the model a few times during the building process. You may also prompt them to build less complex models, such as towers.

Upper Key Stage 2:

Ask the pupils to use more bricks, and prompt them to build more complex models. You could also introduce a time limit.



Ask the pupils to sit back-to-back like the minifigures in this model.



Example solution: Models constructed by Shahad and Rikke, Denmark. After placing them side by side, they discussed the differences between the two models.



45210 MoreToMaths Core Set 1-2

Balancing act

Objective: The pupils will explore balance, weight, and scales.

Activity steps

1. Start a discussion about balance. You can ask the pupils to demonstrate balance by standing on one foot or discuss how they play on a see-saw. Talk about the long part that they sit on (the beam), and the part in the middle that doesn't move (the fulcrum) around which the effort (the force) and load (weight) move.
2. Show the pupils an example of a balance scale. Discuss the scale's components and purpose. Tell the pupils that they are going to build scales.
3. Ask the pupils to use their LearnToLearn sets to build a set of scales. You can demonstrate building the balance mechanism using the bricks in the sidebar image. Encourage the pupils to experiment with their scales by adjusting the position of the fulcrum and the distance of the effort and load.
4. When the pupils have finished building their scales, ask them to take turns with a partner, placing bricks or a "weight" on one side of the scales. Ask them to discuss their findings.

Discussion questions

- When placing weight on one side of the scales, how did you know which side was heavier and which was lighter?
- How did you know when the scales were balanced?
- Were there any bricks that looked different but had the same weight?

Extension

Explain to the pupils that there are many types of scales. Ask them to research the different kinds and to build a model based on their research, or ask them to invent their own set of scales.

Delve deeper into Science by exploring levers and balance with the 9686 Simple & Powered Machines Set. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Explain that a lever is the plank that goes up and down and the fulcrum is the middle that stays in the same place.

Upper Key Stage 2:

Tell the pupils to use the white, 1x10 plates from both sets to create a long lever. Remind them that they should put one white, 1x10 plate back in each set when they tidy up.



Balance mechanism elements



Example solution: A scale constructed by LEGO® Education designer Ina, Denmark



9686 Simple & Powered Machines Set

Brick biology

Objective: The pupils will explore and demonstrate an understanding of animals and their habitats.

Activity steps

1. Start a discussion about animals and their habitats. You could structure the activity around a specific animal or group, such as domestic, wild, or endangered animals.
2. Ask the pupils to work with a partner. Prompt them to work together to decide on an animal.
3. Tell the pupils to use one of their LearnToLearn sets to build the animal they have chosen. They will use the other set during the next step.
4. Then, ask the pupils to construct their animal's habitat using the other partner's LearnToLearn set. Remind them to keep the sets separate in order to make tidying up easier.
5. Encourage the pupils to share and discuss, first with another group, then with the whole class – if time allows.

Discussion questions

- What are the characteristics of your animal and its habitat?
- How has the animal adapted to live in this habitat?
- Is the animal endangered? If so, why or how is it endangered?

Extension

Encourage the pupils to write words, sentences, or paragraphs about their animals and habitats. Let the pupils keep their models in front of them while writing, this will help them to use more descriptive language. You could also take photographs of each model and display the pictures in the classroom alongside what they have written.

Delve deeper into Science by building models of wild animals and making them come to life by programming with the 45300 WeDo 2.0 Core Set. Go to www.LEGOEducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Before starting the activity, you may wish to show pictures of animals and examine and discuss their habitats. Write a list of animals for the pupils to choose from.

Upper Key Stage 2:

Ask the pupils to research specific animals and to incorporate their research into their models.



Example solution: A turtle constructed by Cooper and Josie, United States



Example solution: A beach, the turtle's habitat, constructed by Cooper and Josie, United States



45300 WeDo 2.0 Core Set

Super structures

Objective: The pupils will explore structure, stability, and weight as they build towers.

Activity steps

1. Start a discussion about towers. You can show pictures or videos of real-life towers.
2. Tell the pupils that they are going to make their own towers. Ask them to work with a partner using one LearnToLearn set to build the tallest tower they can.
3. When the pupils have finished building, ask the class to take a “learning walk” to see all of the different designs.
4. Decide, as a class, on a way to measure the towers to see which is the tallest.
5. Have a class discussion about the strategies used to create the tallest towers. Ask what worked well and what did not work well.
6. Ask the pupils to predict which tower would prove to be the most stable structure, if the surface the models are standing on began to shake. Encourage them to explain their reasoning.

Discussion questions

- What did you learn from looking at your classmates’ designs?
- How did you work together?
- How else could you have measured the towers?

Extension

Extremely tall towers can be very unstable. Discuss the concept of the centre of gravity. Ask the pupils to test the stability of their structures by gently shaking the baseplates. Discuss how to create an accurate test to find the most stable structure in the classroom. Conclude by asking the pupils to reflect on their hypothesis.

Delve deeper into Science by testing structures with an earthquake simulator, with the 45300 WeDo 2.0 Core Set. Go to www.LEGOEducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Provide pupils with guidance for building stable towers, such as creating a wider base, and using as many bricks as possible from the set.

Upper Key Stage 2:

Give pupils a time limit for how long they have to design and build.



Example solution: A skyscraper constructed by Lexi, United States



45300 WeDo 2.0 Core Set

Worms and birds

Objective: Pupils will explore the principles of programming by participating in a strategic game.

Activity steps

1. Tell the pupils about the worm and the bird, who are very hungry. The worm really wants to reach the apple so it can eat it, but it has to be very careful, because the bird wants to eat the worm.
2. Ask the pupils to take out the required bricks and set them up on the baseplate as shown in the sidebar.
3. Explain to the pupils that the worm needs to reach the apple without touching the bird, and that the only way to do this is by using the bricks in front of them. The pupils should count the number of studs on each brick – this represents the number of studs that they can move the worm on the baseplate.

Each brick has an assigned action.

- | | |
|----------------------|-------------------|
| Red: move forwards | Yellow: turn left |
| Blue: move backwards | Round: turn 180° |
| Orange: turn right | |

4. Tell the pupils to choose their bricks carefully; for example, each red brick has four studs. If this brick is selected, the worm can move four studs forward. They should not attach the bricks to the baseplate. Instead, the selected bricks should be placed in a separate pile. Ask the pupils to work independently to complete the task.
5. Ask the pupils to reveal which bricks they used and to compare their solutions to the task. Explain that all solutions are correct and there are several ways to achieve the same result.

Discussion questions

- How did you decide which route to take?
- What was the most difficult part of the task?
- How is your LEGO® brick solution similar to computer programming?

Extension

Ask the pupils to work in pairs to build the extension model shown in the sidebar. This time, one pupil should control the worm while the other pupil controls the bird. The objectives are for the worm to reach the apple, and for the bird to catch the worm before it reaches the apple.



30-45 min.

Year group modifications

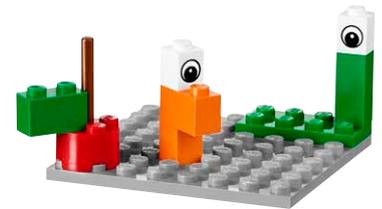
Key Stage 1,

Lower Key Stage 2:

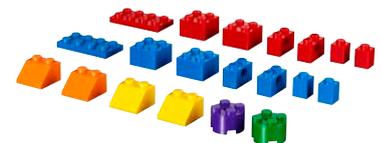
In pairs, let the pupils create three different routes.

Upper Key Stage 2:

Ask the pupils to create more obstacles and complete the task again.



Example solution: The beginning of the game



Elements for the game



Example solution: The beginning of the extension game



45300 WeDo 2.0 Core Set

Delve deeper into Computing by exploring the principles of programming with the 45300 WeDo 2.0 Core Set. Go to www.LEGOEducation.com to learn more!

A place to call home

Objective: The pupils will explore house designs from different cultures.

Activity steps

1. Start a discussion about key elements of a specific culture. You may choose one from a recent curriculum topic.
2. Tell pupils that people often construct houses to fit the specific needs of their culture. The type of house often depends on the geography of the area, availability of resources, the lifestyle of the people, and the needs of their culture. Discuss these influences in relation to the specified culture.
3. Ask the pupils to use their LearnToLearn sets to construct a house for people from the specified culture.
4. When the pupils have finished building, ask them to share their models with the person next to them, and to explain the special features that make the model suited to the specified culture.

Discussion questions

- What materials would your house be made of in the real world?
- How would people build the house you designed in the real world?
- How does your house accommodate the environment and the needs of the specified culture?

Extension

Ask the pupils to consider how housing will be different in the future. They might discuss how new inventions and technology will influence house construction and design. Ask the pupils to build a house of the future. Take photographs of the original model and the new model so that pupils can compare and contrast the two.

Delve deeper into Humanities by exploring community and other areas of the world with the 45110 BuildToExpress Core Set. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Ask the pupils to build the house they live in before building a house from a specified culture, as this will be easier to relate to.

Upper Key Stage 2:

Ask the pupils to consider that people with unique roles in a culture may need unique houses. Ask them to incorporate these differences into their models.



Example solution: A house constructed by Mu, Singapore



Example solution: A castle constructed by Seungyeon, South Korea



45110 BuildToExpress Core Set

Community planner

Objective: The pupils will explore communities and the needs of citizens.

Activity steps

1. Start a discussion about communities by asking pupils to describe the community in which they live.
2. Tell the pupils that they are going to build a community. This community will need amenities, such as shops, schools, restaurants, emergency services, and so forth.
3. Ask the pupils to use their LearnToLearn sets to build an amenity for their community. Tell them to label their models with their own names and the name of the amenity.
4. As the pupils finish building and to organise their models into a community. Start a class discussion as the pupils look at and analyse all of the models together. Ask them what they need to add or change in order to make sure that the citizens of the community have everything they need.
5. Continue modifying the community until the whole class is satisfied that it is complete, and then ask the pupils to create a name for their community.

Discussion questions

- How did you work together to complete the community?
- What are the most important components of the community and why?
- How does this community compare to the community that you live in?

Extension

Ask the pupils to design posters, brochures, or business cards that promote the business or describe the function of the amenity they have created.

Delve deeper into Humanities by exploring community and other areas of the world with the 45110 BuildToExpress Core Set. Go to www.LEGOeducation.com to learn more!



45-60 min.

Year group modifications

Key Stage 1,

Lower Key Stage 2:

Start by asking the pupils to make a list of the buildings and amenities that they see in their own communities. When they start to build their models, tell them that they can refer to the list if needed.

Upper Key Stage 2:

Discuss the idea of trading goods and services.



Example solution: A "burger bar" constructed by William, United Kingdom



Example solution: A community created by teacher Amy's class, United Kingdom



45110 BuildToExpress Core Set

People perspectives

Objective: The pupils will demonstrate an understanding of the characteristics of important people.

Activity steps

1. Start a discussion about the roles of people in communities all over the world. Ask the pupils to give examples of people who have important roles within a community. You may choose to focus on a specific person the class has been learning about.
2. Prompt the pupils to think about details and important characteristics of this person. This may include what the person looks like, what they do, who they know, and so forth.
3. Ask the pupils to use their LearnToLearn sets to construct a model that represents this person, including the details they recalled.
4. When the pupils have finished building, prompt them to write words or sentences about the person they have chosen. When they have finished writing, ask them to share what they have written in small groups or with the whole class, if time allows.

Discussion questions

- What key details are most important about the person you have chosen?
- What were the most important bricks in your model?
- How does/did this person affect the community or world?

Extension

Ask the pupils to consider new roles that might play an important part in the communities and the world of the future. Ask questions, such as: Who will fill these roles? How can you and your classmates become people who will benefit the community or the world? Ask them to write or discuss how they will affect their community, or the world, in the future.

Delve deeper into Humanities by sharing different perspectives and expressing ideas with the 45110 BuildToExpress Core Set. Go to www.LEGOeducation.com to learn more!



30-45 min.

Year group modifications

Key Stage 1:

The pupils can focus on a type of community helper rather than a specific person, such as a police officer, firefighter, teacher, or town mayor.

Key Stage 2:

Pupils could focus on historical figures from recent units of study, from different eras, cultures, and so forth, such as famous political leaders, activists, authors, and artists.



Example solution: A lifeguard constructed by Charlotte, Australia



Example solution: A drummer constructed by Jungyoung, South Korea



45110 BuildToExpress Core Set

Building License cards

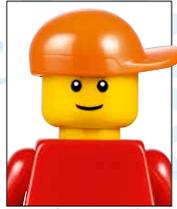
Print enough copies to supply each of your pupils with a licence. Cut out the cards and award one to each pupil when they have completed "Building Licence – Ready, Set, Build!". Ask the pupils to enter their details. If you prefer, you can print a photograph of each pupil and ask them to affix it to the licence where the minifigure appears. You may also choose to laminate the completed licence cards.

Building License

Name: _____

Age: _____

Favorite object to construct: _____



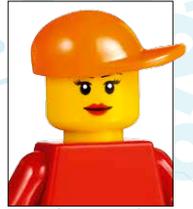
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Favorite object to construct: _____



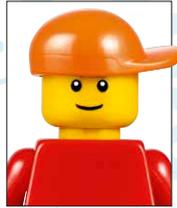
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Favorite object to construct: _____



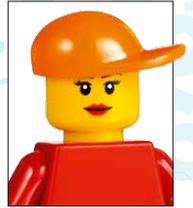
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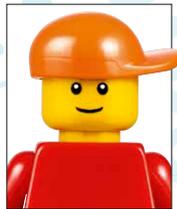
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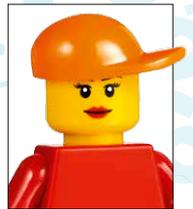
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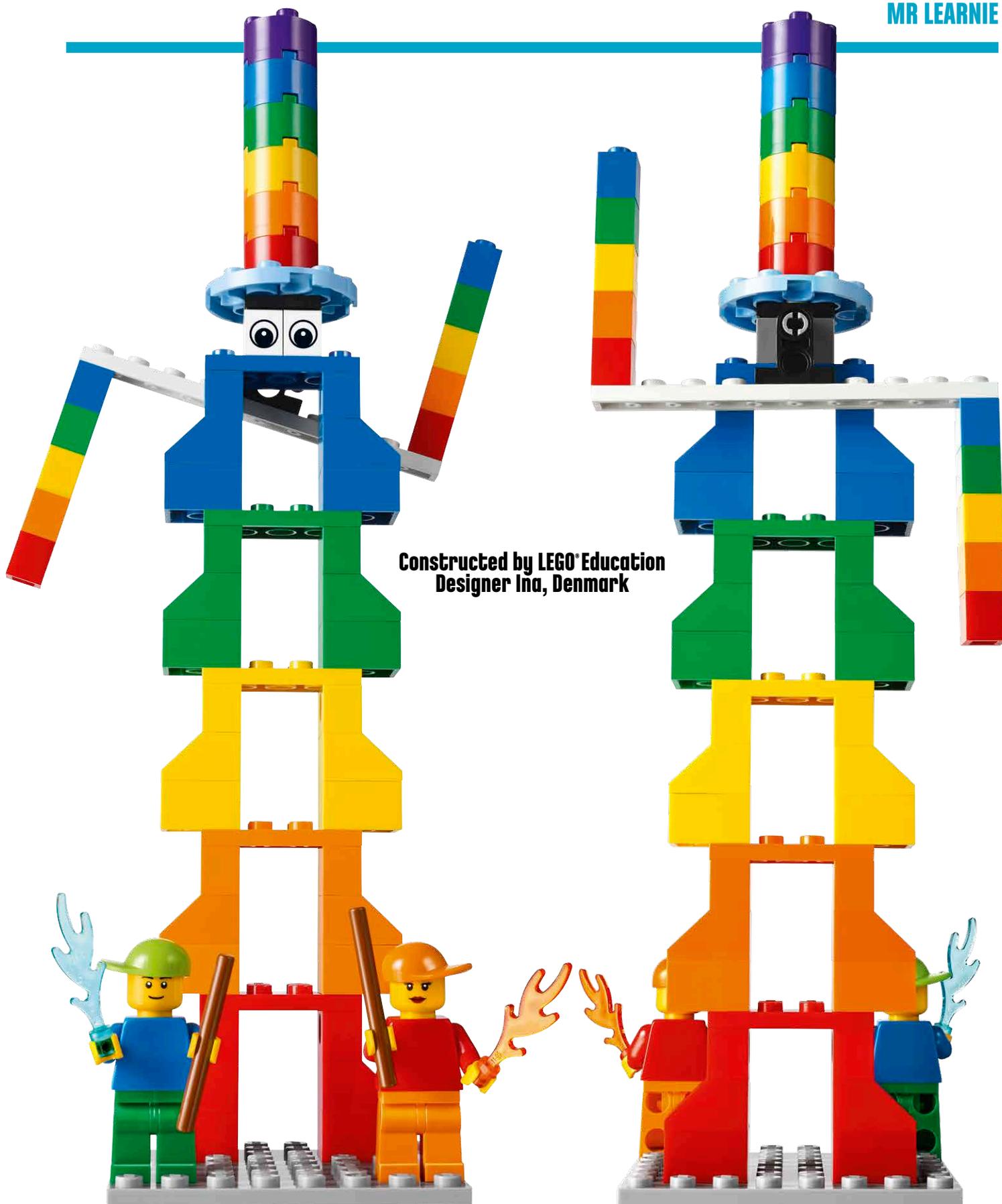
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Favorite object to construct: _____



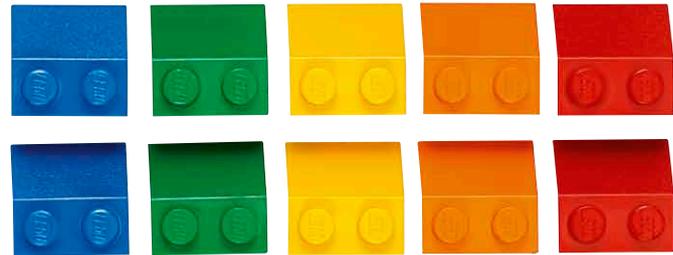
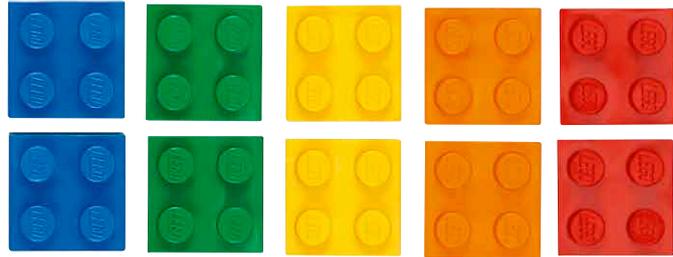
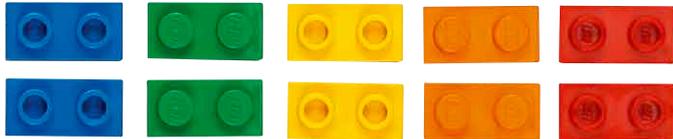
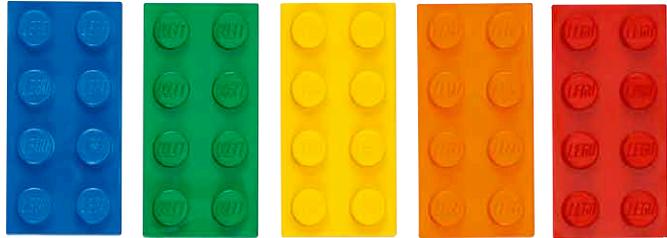
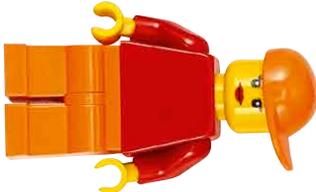
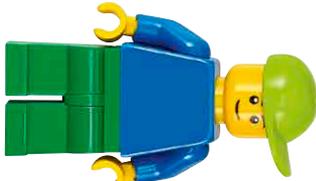
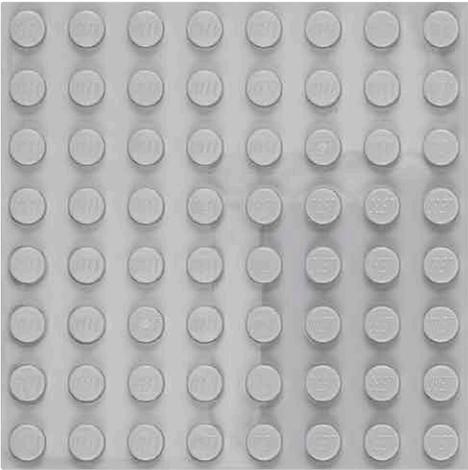
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Constructed by LEGO® Education
Designer Ina, Denmark

Front view 1:1

Back view 1:1



Dear School Management

I am writing to inform you about LEGO® Education LearnToLearn, a unique and cross-curricular tool that I feel will be a valuable addition to my classroom.

The LearnToLearn solution is based on the educational theory of Constructionism, which is rooted in the belief that children learn best when they experience things first-hand and within a meaningful context.

I truly believe that this hands-on experimentation with concrete materials will lead to deeper engagement and development of the skills of the 21st century: Collaboration, Communication, Creativity, Critical Thinking and Problem Solving.

Perhaps the best news is that the cost of an entire classroom implementation of LEGO Education LearnToLearn is minimal; we could even finance it within the classroom budget.

By way of conclusion, I would like to quickly review the benefits of integrating this solution:

- Directly addresses several areas of our curriculum.
- Constructionist approach to learning, resulting in higher pupil engagement and memorable experiences.
- Supports fundamental skills of the 21st century.
- Very affordable, i.e., doesn't compete with books, etc.
- Reputable company involved in education for over thirty years.

I truly hope you are as excited about this idea as I am, and I look forward to hearing your thoughts and to answering any other questions you may have.

Thank you for your time.



Dear Parent

Our class will soon begin using a new learning tool called LEGO® Education LearnToLearn. I am writing to let you know how we will implement this learning tool, how it works, and how I expect it to benefit your child.

Learning by doing

For over thirty years, LEGO Education has been developing educational solutions based on a well-established educational theory that maintains that children learn best and remember more through hands-on experience with physical objects.

Teaching required subjects using a hands-on approach

In our class, we will be incorporating LearnToLearn across the areas of Design & Technology, Literacy, Maths, Science, Computing, and Humanities. However, instead of memorising the abstract principles and formulas related to these subjects, your child will use LEGO bricks to construct knowledge in the subject areas and to develop skills needed for the 21st century.

Learning to learn

With the integration of this solution into our curriculum, I hope that your child will not only learn subjects more effectively, but will also improve their collaboration, communication, creativity, critical thinking, and problem-solving skills.

Most importantly, your child will be learning to learn in a new and exciting way. Our goal is that this new solution will stimulate every child's love of learning.

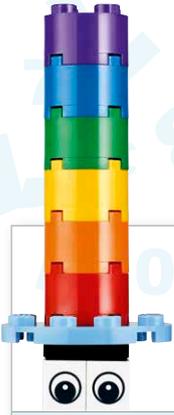
I look forward to sharing the results with you at our next parent-teacher conference.

Kind regards,



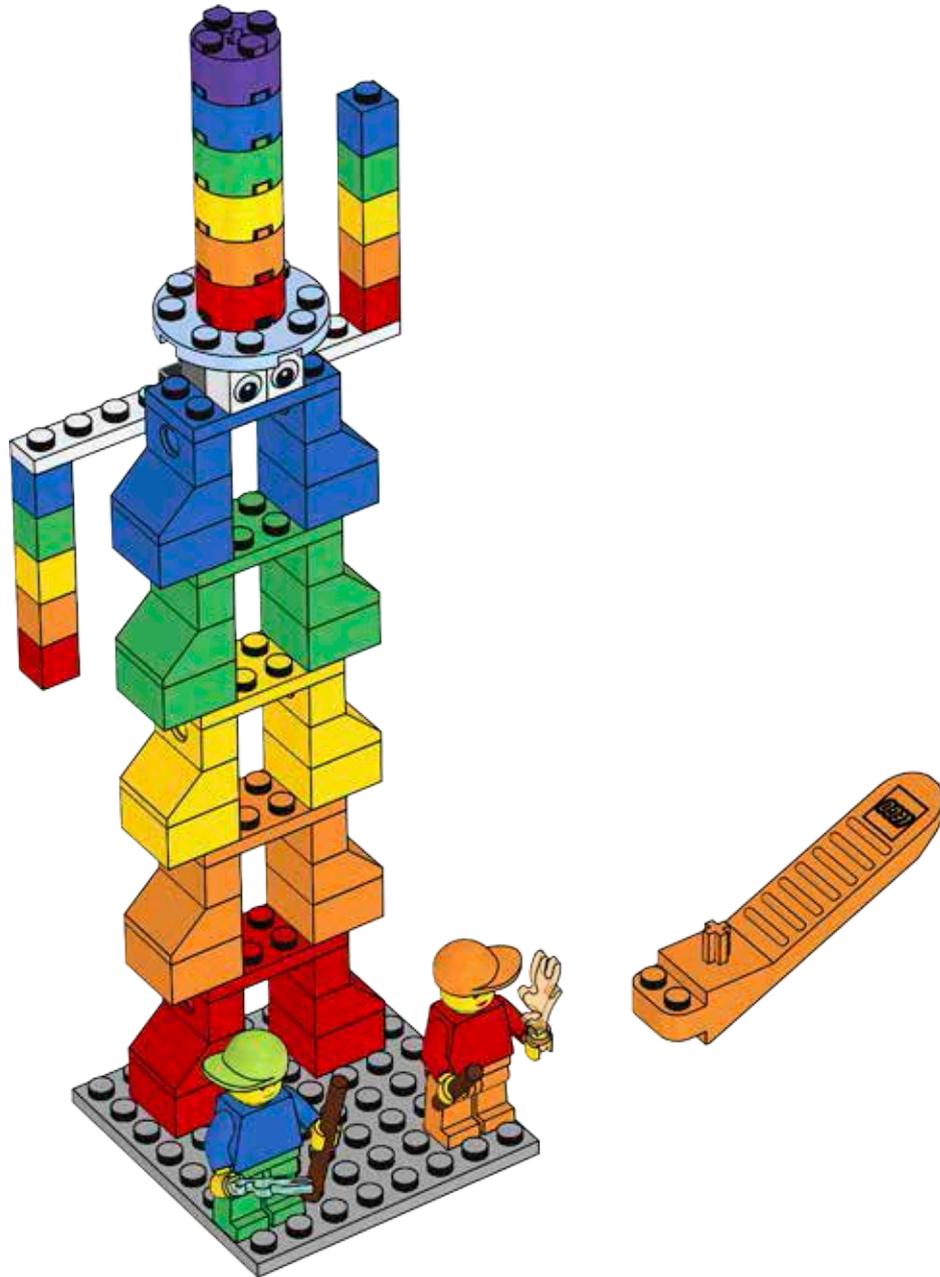
LEGO® Education product grid

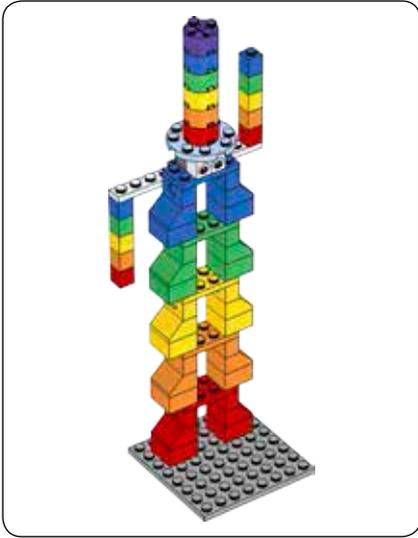
Now that you have tried LearnToLearn, you probably want more LEGO® Education sets to explore the subject areas and to further develop your pupils' 21st century skills. Look at the chart below to see which sets would best complement your curriculum based on your favourite LearnToLearn activities. Then go to www.LEGOEducation.com for availability and ordering information!



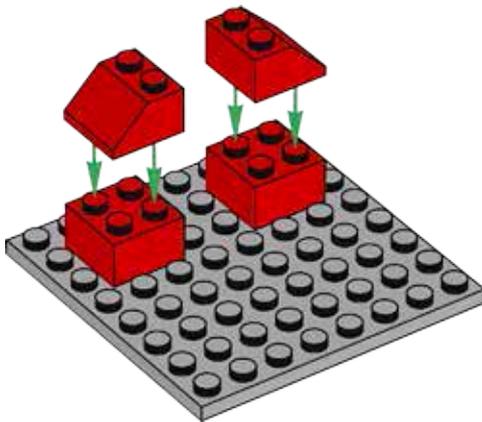
	45100 StoryStarter Core Set and StoryVisualizer software	45110 BuildToExpress Core Set	45300 WeDo 2.0 Core Set	45210 MoreToMaths Core Set 1-2	9689 Simple Machines Set	9686 Simple & Powered Machines Set
Design & Technology activities						
Across the river						
Maggie's wheelchair						
My machine invention						
Literacy activities						
Scene builders						
What's that sound?						
Why describe?						
Maths activities						
Block and cover						
Mirror, mirror						
What's behind my back?						
Science activities						
Balancing activities						
Brick biology						
Super structures						
Computing activities						
Worms and birds						
Humanities activities						
A place to call home						
Community planner						
People perspectives						

Mr Learnie

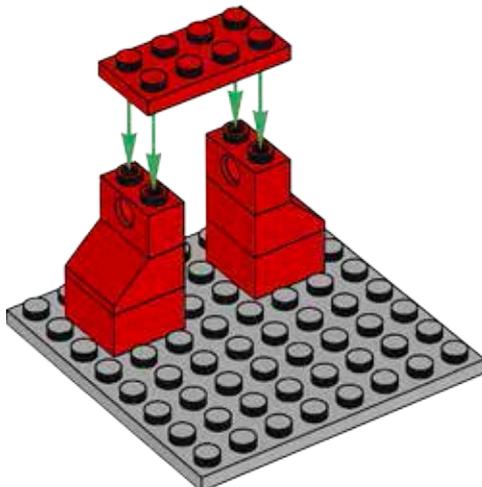




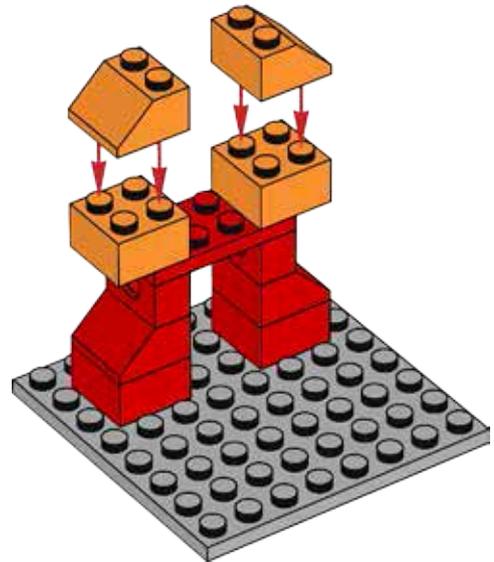
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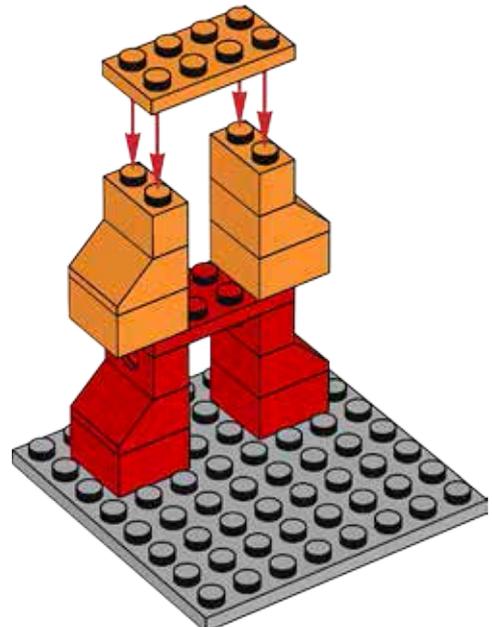
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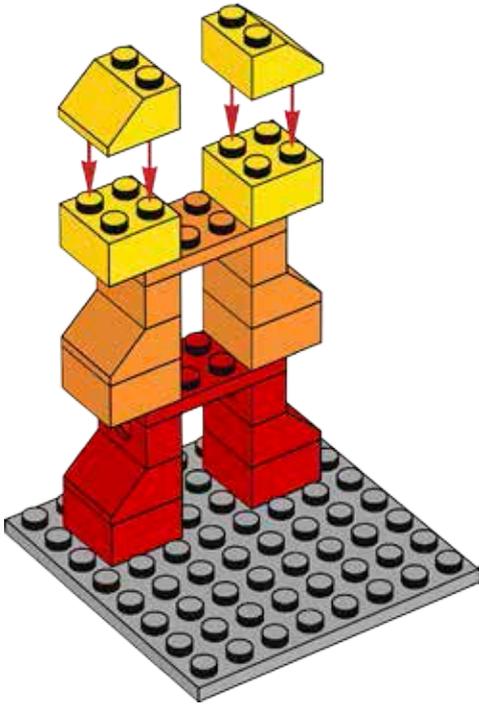
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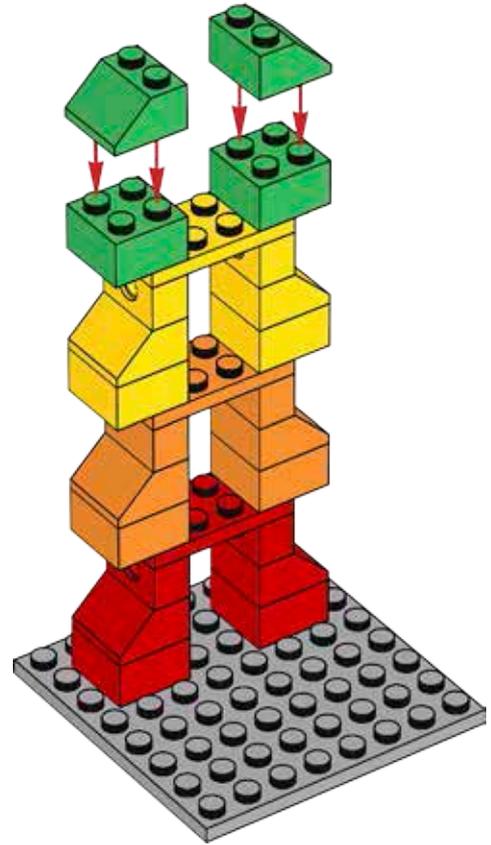
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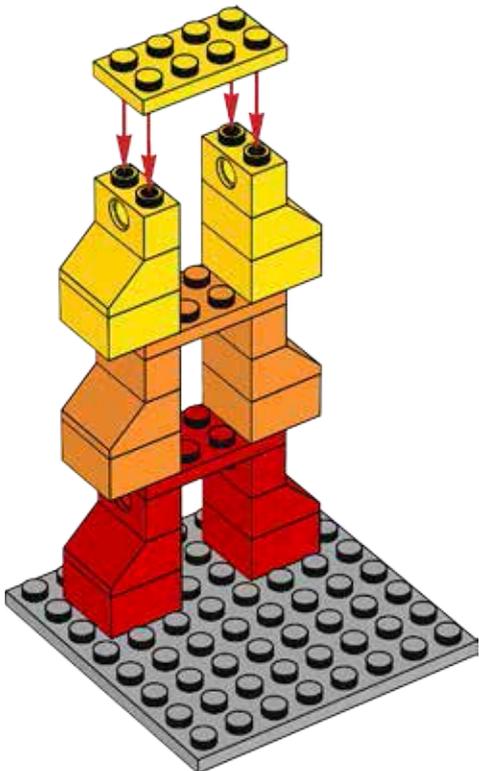
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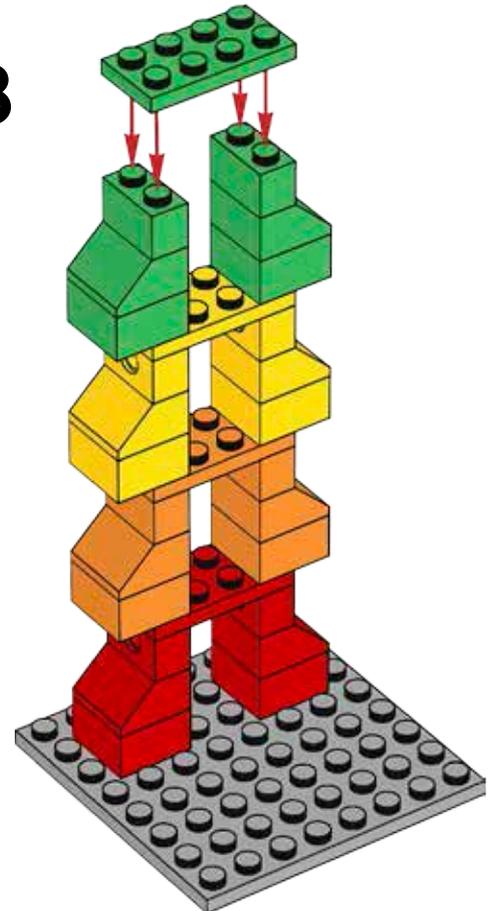
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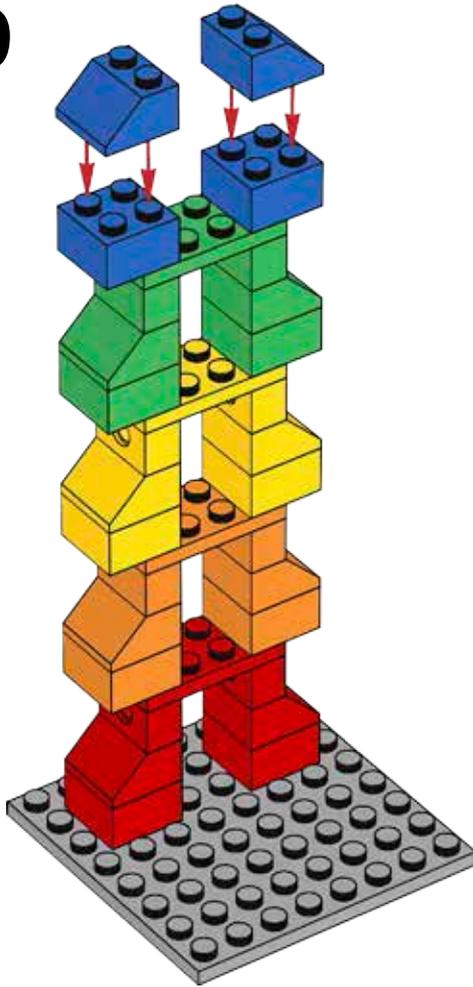
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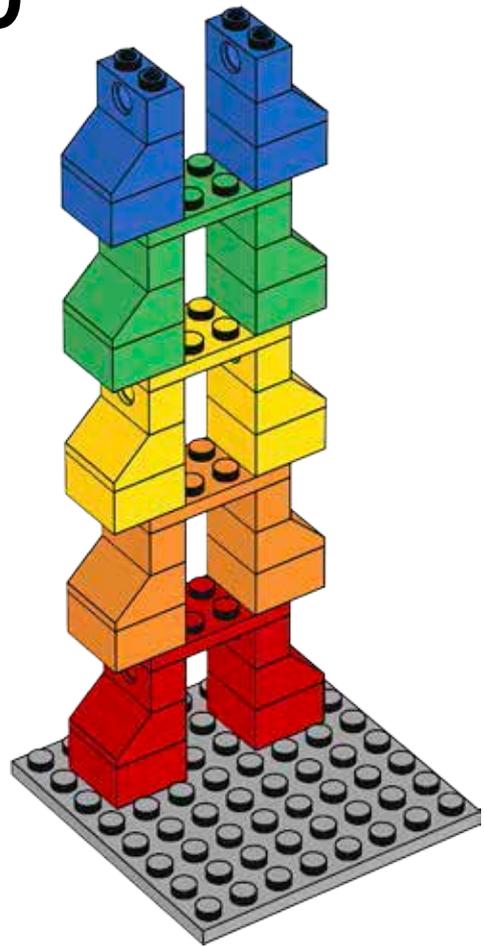
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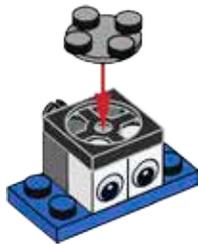




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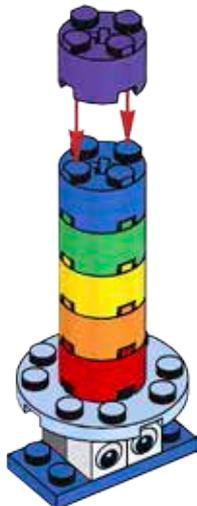
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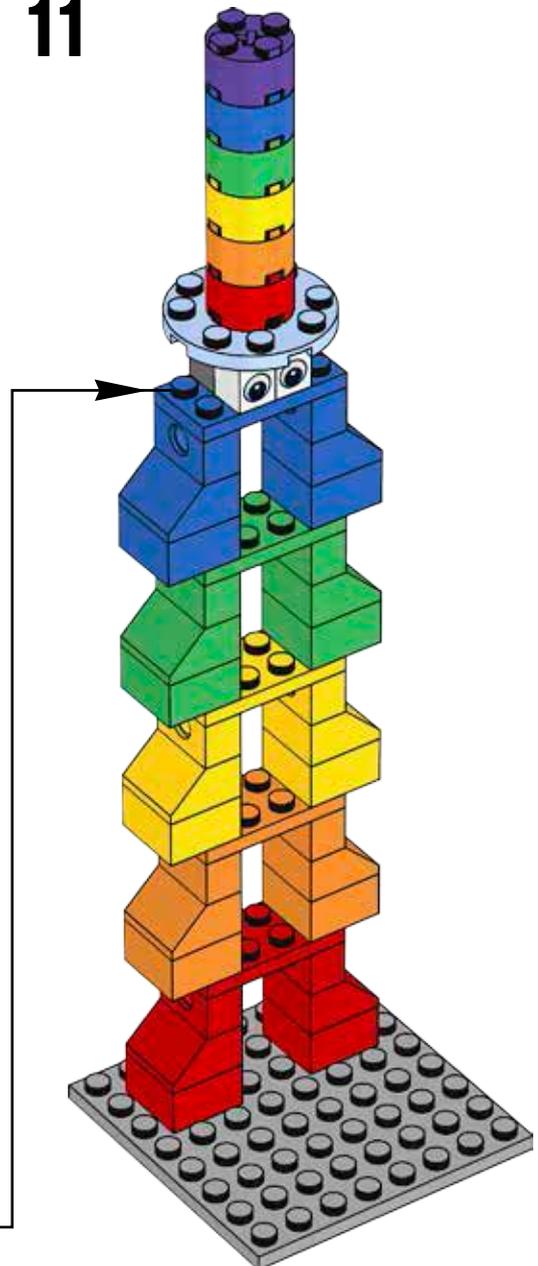
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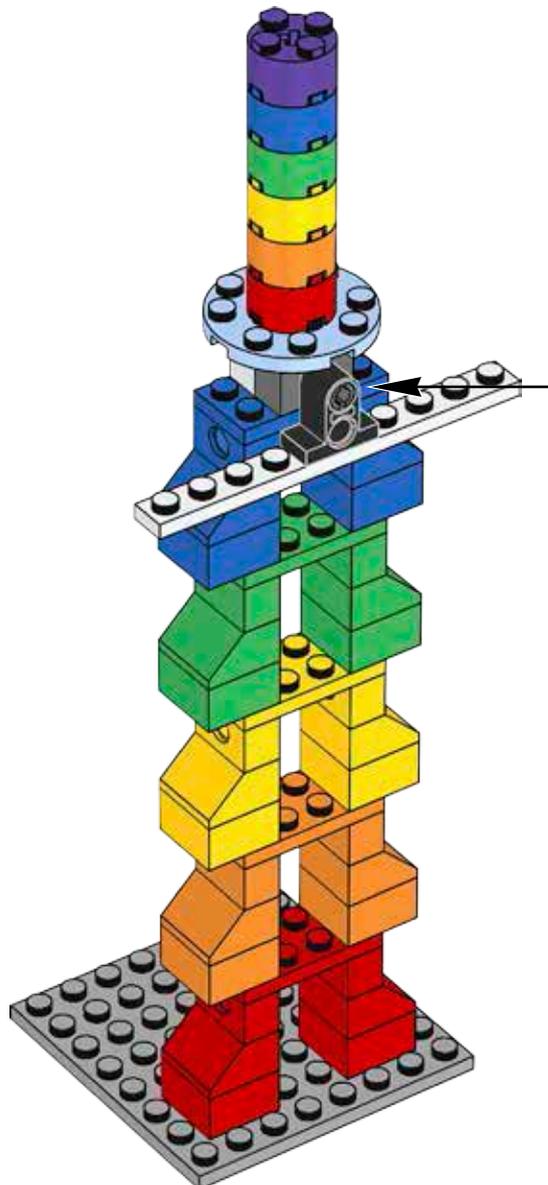
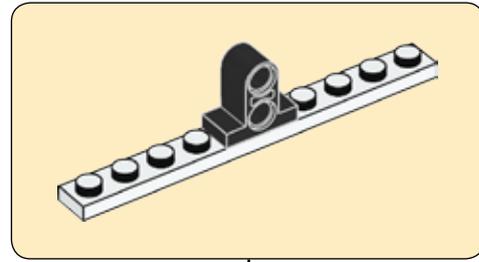
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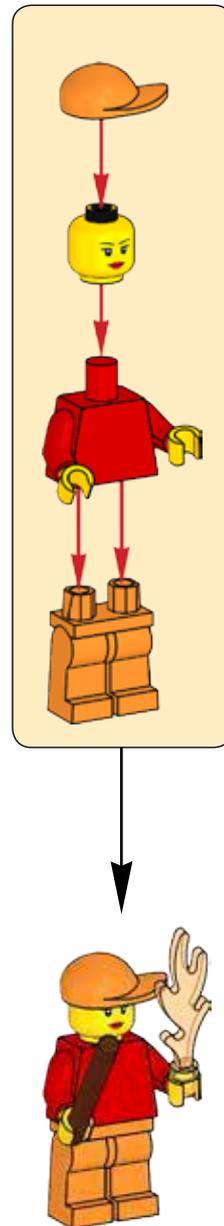
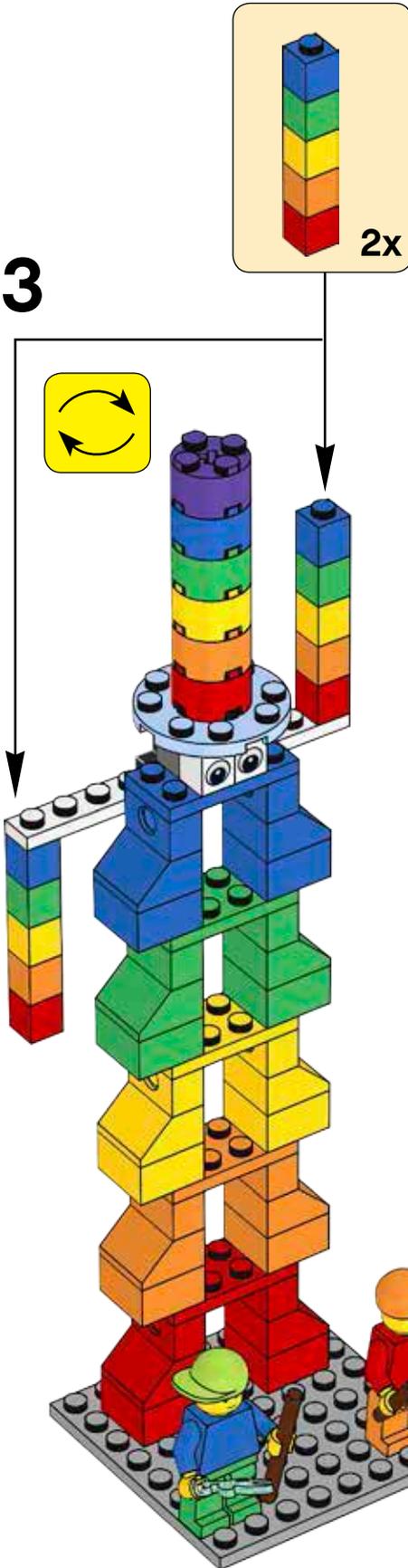
11



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education